No. 200000156

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Montana Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR ESSENTIALLY DERIVED VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED, (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BARLEY

'Valier'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this seventeenth day of September, in the year two thousand and four.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions*

Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1 NAME OF OWNER	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME	3. VARIETY NAME
Montana Agricultural Experiment Station	MTLB30	Valier

4 ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*	5. TELEPHONE *(include area code)*	FOR OFFICIAL USE ONLY
202 Linfield Hall Montana State University Bozeman, MT 59717	406 994 3681	PVPO NUMBER 200000156
	6. FAX *(include area code)* 406 994 6579	FILING DATE 2/15/00

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*	8. IF INCORPORATED, GIVE STATE OF INCORPORATION	9. DATE OF INCORPORATION
Agricultural Experiment Str.		

10 NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*

Dr. Thomas K. Blake
Department of Plant Sciences
209 Ag Biosciences Bldg
Montana State University
Bozeman, MT 59717

ITEMS RECEIVED

FILING AND EXAMINATION FEES: $ 2450.00
DATE 12-1-99

CERTIFICATION FEE: $ 432.00
DATE 9/07/2004

11. TELEPHONE *(Include area code)*	12. FAX *(Include area code)*	13. E_MAIL	14. CROP KIND *(Common Name)*
406 994 5055	406 994 7600	blake@hordeum.oscs.montana.edu	barley

15 GENUS AND SPECIES NAME OF CROP	16. FAMILY NAME *(Botanical)*	17. IS THE VARIETY A FIRST GENERATION HYBRID?
Hordeum vulgare	Triticeae	☐ YES ☒ NO

18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)

- a. ☒ Exhibit A. Origin and Breeding History of the Variety
- b. ☒ Exhibit B. Statement of Distinctness
- c. ☒ Exhibit C. Objective Description of Variety
- d. ☐ Exhibit D. Additional Description of the Variety *(Optional)*
- e. ☒ Exhibit E. Statement of the Basis of the Owner's Ownership
- f. ☒ Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
- g. ☒ Filing and Examination Fee ($2,450), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *See Section 83(a) of the Plant Variety Protection Act)*

☒ YES *(If "yes", answer items 20 and 21 below)* ☐ NO *(If "no," go to item 22)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

☒ YES ☐ NO

21. IF "YES" TO ITEM 20, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

☒ FOUNDATION ☒ REGISTERED ☒ CERTIFIED

22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?

☐ YES ☒ NO

IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?

☐ YES ☒ NO

IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER	SIGNATURE OF OWNER
Thomas K. Blake	
NAME *(Please print or type)* Thomas K. Blake	NAME *(Please print or type)*
CAPACITY OR TITLE: Professor — DATE: 10/20/99	CAPACITY OR TITLE — DATE

INSTRUCTIONS

200000156

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable *(in the sense that it will reproduce an entire plant)* tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for $2,450 ($300 filing fee and $2,150 examination fee), payable to "Treasurer of the United States" *(See Section 97.6 of the Regulations and Rules of Practice.)* Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfiled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. DO NOT use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of $300 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office
Telephone: (301) 504-5518
FAX: (301) 504-5291
Homepage: http://www.ams.usda.gov/science/pvp.htm

ITEM

18a. Give:
(1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified

18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:

(1) identify these varieties and state all differences objectively;
(2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
(3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness

18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.

18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, *etc.*

18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.

19. If "Yes" is specified *(seed of this variety be sold by variety name only, as a class of certified seed)*, the applicant MAY NOT reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. *(See Regulations and Rules of Practice, Section 97.103).*

22. *See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.*

23. *See Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date.*

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22. CONTINUED FROM FRONT *(Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)*

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23. CONTINUED FROM FRONT *(Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)*

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. *(See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)*

To avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center–East, Beltsville, MD 20705. Telephone: (301) 504-8089.

S&T-470 (6-98) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (03-96) which is obsolete.

Exhibit A. Origin and Breeding History of Valier

'Valier' (PI 610264) barley derived from one of a population of single-seed descent F_5 plants which were advanced without selection from a single F_1 plant derived from the cross of Lewis and Baronesse. These 60 F_5 plants were subjected to one season of seed increase near Yuma, Arizona, and were then used as a mapping population in a series of experiments to discover the genetic basis for the yield advantage of Baronesse in Montana crop production environments. Randomized complete block experiments of these 60 full sib F_5 derived lines, with the parents and two other check varieties included were grown on Montana Agricultural Experiment Station experimental farms near Bozeman, Havre and Sidney Montana in the summers of 1995 and 1996. A genome-spanning molecular marker map was also made in this population in 1995. The field analysis data and mapping data were analyzed, resulting in the development of a quantitative trait locus manuscript (Blake et al., 1998). Headrows from 'Valier' and three sister lines which also showed excellent yield potential were increased in the spring of 1997, then again in 1998. These experimental lines were simultaneously entered in the Montana Statewide Varietal Trial system, and were grown in 20 acre plots to provide sufficient grain for evaluation in cattle feeding experiments (Boss et al., 1999).

In our headrow advancement evaluation, only 'Valier' showed no headrow-to-headrow variation. Approximately 200Kg of Valier seed was planted in a winte increase field near Christchurch, New Zealand in the winter of 1998-1999. Approximately 10 metric tons of breeder's seed returned to Montana from New Zealand in the early spring of 1999. This seed was used for foundation and registered seed production by the Montana Foundation Seed Program and the Montana Agricultural Experiment Station in the spring and summer of 1999. Foundation and Registered seed was made available to growers in the spring of 2000.

Uniformity and Stability

Valier has been grown and evaluated under commercial production conditions at many locations across Montana for 4 growing seasons, and no variants have been observed. This appears to be a remarkably uniform and stable barley variety. The locations at which large-scale growouts have been done include the Montana Agricultural Experiment Station research farms near Bozeman, MT, Conrad, MT, Havre, MT, Sidney, MT and Huntley MT.

18b. Varietal Distinctness

Valier is morphologically more similar to Baronesse than to other varieties ~~grown in the Northern Plains~~. Valier differs from Baronesse by its sterile lateral florets. Baronesse is deficient with respect to lateral florets. Valier is two days later to flower than Lewis, six days later than Stark. Valier's tendency to develop purple-tipped awns, while not unique, is an unusual and distinctive field marker. A large array of molecular marker data is available to support the claim of varietal distinctness (Blake et al., ~~1996~~). 1998.
Valier has the typical sterile lateral florets, whereas the lateral florets of 'Baronesse' are deficient.
Your search for varietal similarity displayed 'Lamont' as a similar variety. We've not grown Lamont in our yield trials since 1985, so reliable morphometric data was not available to us. We examined a number of molecular markers, and the easiest markers which clearly distinguish Valier from Lamont are the major seed storage proteins. Lamont carries the seed storage protein profile common to the 'Betzes' lineage of barley varieties, while 'Valier' carries the seed storage protein alleles from 'Baronesse'. I've included a dried SDS-PAGE gel so that you can see the results.

N.B. The data below are derived from the Montana Agricultural Experiment Station Statewide irrigated and dryland barley yield trial experiments, from 1997 and 1998. All varieties in the trials are compare with 'Valier' using a t-test. The Montana Agricultural Experiment Station barley yield trials consist of 64 entries seeded in 4 row, 4 meter long plots, with rows 0.3 meters apart. Each experiment consists of three replications, randomized so that a lattice analysis may be performed . The t-tests shown below are contrasts of the means of each of these experiments. The individual plant height, heading date, grain yield and test weight data points are based on whole plot analysis. Each plot contains approximately 800 plants.

Table 1. Heading Date Comparison
1997-1998 T-PAIRED vs Valier - ALL LOCATIONS -

HEADING DATE (Days from Jan. 1)

ID	NAME	ACTUAL MEAN	NO. OBS	MEAN DIFF	T-PAIRED VALUE	P-VALUE
PI491534	Gallatin	178.0	17	-3.2	-9.0	.000
CI 15856	Lewis	179.6	17	-1.6	-5.2	.000
PI591823	Chinook	179.4	17	-1.8	-4.6	.000
SK 76333	Harrington	181.1	17	-.1	-.2	.841
ND 9866	Stark	175.1	17	-6.1	-17.2	.000
PI568246	Baronesse	181.3	17	.1	.2	.864
H3860224	Lewis/Apex	181.0	17	-.2	-.4	.673
MTLB 2	Lewis/Baro	179.7	17	-1.5	-4.6	.000
MTLB 5	Lewis/Baro	181.1	17	-.1	-.4	.714
MTLB 6	Lewis/Baro	179.1	17	-2.1	-5.4	.000
MTLB 13	Lewis/Baro	179.6	17	-1.6	-4.1	.001
MTLB 57	Lewis/Baro	179.3	17	-1.9	-4.0	.001
SITEMEAN	Sitemean	179.5	17	-1.7	-6.7	.000

THE MEAN FOR THE REFERENCE VARIETY (Valier) IS: 181.2 (N= 17)

Table 2. Yield Comparison

1997-1998 T-PAIRED vs Valier ALL LOCATIONS YIELD (bu/ac)

ID	NAME	ACTUAL MEAN	NO. OBS	MEAN DIFF	T-PAIRED VALUE	P-VALUE
PI491534	Gallatin	94.3	19	-3.5	-2.2	.038
CI 15856	Lewis	92.6	19	-5.1	-3.1	.006
PI591823	Chinook	92.3	19	-5.5	-2.2	.044
SK 76333	Harrington	88.5	19	-9.3	-3.2	.006
ND 9866	Stark	99.6	19	1.8	1.1	.297
PI568246	Baronesse	102.9	19	5.1	3.0	.008
CI 15773	Morex	81.3	9	-14.5	-4.5	.002
H3860224	Lewis/Apex	94.5	19	-3.3	-2.2	.044
MTLB 2	Lewis/Baro	96.1	19	-1.7	-1.2	.232
MTLB 5	Lewis/Baro	99.4	19	1.6	1.1	.277
MTLB 6	Lewis/Baro	98.4	19	.6	.4	.658
MTLB 13	Lewis/Baro	96.9	19	-.9	-.5	.606
MTLB 57	Lewis/Baro	91.3	19	-6.5	-3.0	.007
SITEMEAN	Sitemean	94.5	19	-3.3	-2.8	.011

THE MEAN FOR THE REFERENCE VARIETY (Valier) IS: 97.8 (N= 19)

Table 3. Test Weight Comparison

1997-1998 T-PAIRED vs Valier ALL LOCATIONS TEST WEIGHT (lb/bu)

ID	NAME	ACTUAL MEAN	NO. OBS	MEAN DIFF	T-PAIRED VALUE	P-VALUE
PI491534	Gallatin	52.3	19	.2	1.0	.322
CI 15856	Lewis	52.1	19	.0	.2	.850
PI591823	Chinook	51.2	19	-.9	-2.9	.011
SK 76333	Harrington	49.3	19	-2.7	-7.2	.000
ND 9866	Stark	52.7	19	.6	1.7	.105
PI568246	Baronesse	51.1	19	-1.0	-4.1	.001
H3860224	Lewis/Apex	51.4	19	-.6	-2.7	.015
MTLB 2	Lewis/Baro	52.3	19	.2	.9	.380
MTLB 5	Lewis/Baro	52.7	19	.6	3.4	.004
MTLB 6	Lewis/Baro	52.1	19	.0	.1	.927
MTLB 13	Lewis/Baro	51.4	19	-.7	-2.3	.033
MTLB 57	Lewis/Baro	51.0	19	-1.1	-3.5	.003
SITEMEAN	Sitemean	51.1	19	-.9	-5.0	.000

THE MEAN FOR THE REFERENCE VARIETY (Valier) IS: 52.1 (N= 19)

Table 4. Feedlot performance by beef steers fed Baronesse, Lewis or Valier for 79 days

	Baronesse	Lewis	Valier
79- Day ADG	3.57	3.41	3.84**
Increase(lb/day) over parents (midparent mean)	–	–	0.35
Percent Increase over Parents	-	-	+10% increase

** ANOVA Significant at p<.01

Literature Cited

Boss DL, Bowman JGP, Surber LMM, Anderson DC, Blake TK. 1999. Feeding value of two Lewis x Baronesse Recombinant Inbred Lines, LB13 and LB30, for Finishing Steers. Proc. West Sect. Amer. Soc. An Sci. 50: 293-296.

Blake TK, Larson S, Eckhoff J, Kanazin V. 1998. Avoiding Project Bankruptcy While Effectively Employing Markers. in: ASA,HSSA Joint Symposium on Heterosis, Indianapolis, In. Ed: K. Lamkey, Crop Science Society of America, Madison, WI. Pgs 99-108.

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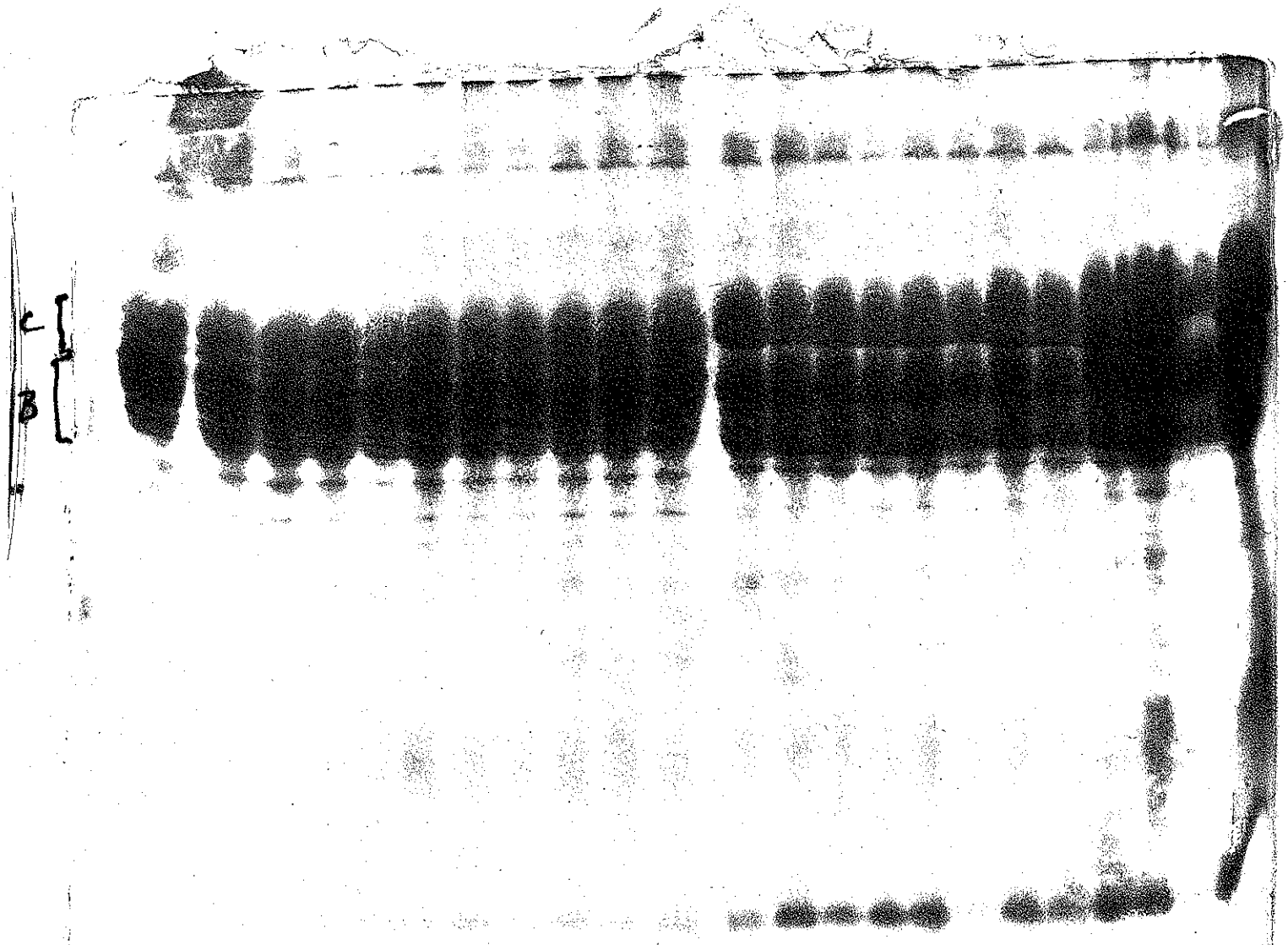
VALIER

LAMONT



6

FORM APPROVED: OMB NO. 40-R3822

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
BELTSVILLE, MARYLAND 20705

EXHIBIT C (Barley)

OBJECTIVE DESCRIPTION OF VARIETY BARLEY (HORDEUM VULGARE)

200000156

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)
MONTANA AGRICULTURAL EXPERIMENT STATION

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)
202 Linfield Hall
MONTANA STATE UNIVERSITY, BOZEMAN, MT 59717

FOR OFFICIAL USE ONLY
PVPO NUMBER

VARIETY NAME OR TEMPORARY DESIGNATION

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (i.e. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

per phone conversation of 5/31/2000 mlt

1. GROWTH HABIT:
[1] 1 = SPRING 2 = FACULTATIVE WINTER 3 = WINTER [2] Early Growth: 1 = PROSTRATE 2 = SEMIPROSTRATE 3 = ERECT

2. MATURITY (50% Flowering):
[2] 1 = EARLY (California Mariout) 2 = MIDSEASON (Betzes) 3 = LATE (Frontier)

[1] No. of days Earlier than ..... [1]
[ ] No. of days Later than ..... [ ]
1 = BETZES 2 = CALIFORNIA MARIOUT 3 = CONQUEST 4 = DICKSON 5 = PIROLINE 6 = PRIMUS 7 = UNITAN

3. PLANT HEIGHT (From soil level to top of head):
[3] 1 = SEMIDWARF 2 = SHORT (California Mariout) 3 = MEDIUM TALL (Betzes) 4 = TALL (Conquest)

[12] Cm. Shorter than ..... [1]
[ ] Cm. Taller than ..... [ ]
1 = BETZES 2 = CALIFORNIA MARIOUT 3 = CONQUEST 4 = DICKSON 5 = PIROLINE 6 = PRIMUS 7 = UNITAN

4. STEM:
[2] Exertion (Flag to spike at maturity): 1 = 0 - 3 cm. 2 = 3 - 10 cm. 3 = 10 - 15 cm. [2] Anthocyanin: 1 = ABSENT 2 = PRESENT

[05] NO. OF NODES (Originating from node above ground)

[2] Collar Shape: 1 = CLOSED 2 = V-SHAPED 3 = OPEN 4 = MODIFIED CLOSED OR OPEN [1] Shape of Neck: 1 = STRAIGHT 2 = SNAKY 3 = OTHER (Specify) _____

5. LEAF:
[1] Basal leaf sheath (seedling): 1 = GLABROUS 2 = PUBESCENT [1] Position of flag leaf (at boot stage): 1 = DROOPING 2 = UPRIGHT

[2] Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY 3 = WAXY [12] MM. WIDTH (First leaf below flag leaf)

[20] CM. LENGTH (First leaf below flag leaf) [2] Anthocyanin in leaf sheath: 1 = ABSENT 2 = PRESENT

6. HEAD:
[1] Type: 1 = TWO-ROWED 2 = SIX-ROWED [2] Density: 1 = LAX 2 = ERECT (Not dense) 3 = ERECT (Dense)

[2] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____ [2] Waxiness: 1 = ABSENT (Glossy) 2 = SLIGHTLY WAXY 3 = WAXY

[1] Lateral Kernels Overlap: 1 = NONE 2 = AT TIP 3 = 1/4 - 1/2 OF HEAD [2] Rachis (Hair on edge): 1 = LACKING 2 = FEW 3 = COVERED

7. GLUME:
[2] Length: 1 = 1/3 OF LEMMA 2 = 1/2 OF LEMMA 3 = MORE THAN 1/2 OF LEMMA [3] Hairs: 1 = NONE 2 = SHORT 3 = LONG

[4] Hair covering: 1 = NONE 2 = RESTRICTED TO MIDDLE 3 = CONFINED TO BAND 4 = COMPLETELY COVERED

[1] Awns: 1 = LESS THAN EQUAL TO LENGTH OF GLUMES 2 = EQUAL TO LENGTH OF GLUMES 3 = MORE THAN EQUAL TO LENGTH OF GLUMES

[2] Awn Surface: 1 = SMOOTH 2 = SEMISMOOTH 3 = ROUGH

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8. LEMMA:

[5] Awn: 1 = AWNLESS 2 = AWNLETS ON CENTRAL ROWS, AWNLESS ON LATERAL ROWS
3 = SHORT ON CENTRAL ROWS, AWNLETS ON LATERAL ROWS 4 = SHORT (less than equal to length of spike)
5 = LONG (longer than spike) 6 = HOODED

[4] Awn Surface: 1 = AWNLESS 2 = SMOOTH 3 = SEMISMOOTH 4 = ROUGH

[2] Teeth: 1 = ABSENT 2 = FEW 3 = NUMEROUS

[2] Hair: 1 = ABSENT 2 = PRESENT

[2] Shape of base: 1 = DEPRESSION 2 = SLIGHT CREASE 3 = TRANSVERSE CREASE

[2] Rachilla Hairs: 1 = SHORT 2 = LONG

9. STIGMA:

[1] Hairs: 1 = FEW 2 = MANY

10. SEED:

[2] Type: 1 = NAKED 2 = COVERED

[2] Hairs on Ventral Furrow: 1 = ABSENT 2 = PRESENT

[4] Length: 1 = SHORT (8.0 mm.) 2 = SHORT TO MIDLONG (7.5 - 9.0 mm.) 3 = MIDLONG (8.5 - 9.5 mm.)
4 = MIDLONG TO LONG (9.0 - 10.5 mm.) 5 = LONG (10.0 mm.)

[2] Wrinkling of hull: 1 = NAKED 2 = SLIGHTLY WRINKLED 3 = SEMIWRINKLED 4 = WRINKLED

[1] Aleurone Color: 1 = COLORLESS (White or Yellow) 2 = BLUE

[0][2] PERCENT ABORTIVE

[4][5] GMS. PER 1000 SEEDS

11. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SEPTORIA	[0] NET BLOTCH	[0] SPOT BLOTCH	[0] POWDERY MILDEW
[0] LOOSE SMUT	[0] BACTERIAL BLIGHT	[0] COVERED SMUT	[0] FALSE LOOSE SMUT
[0] STEM RUST	[0] LEAF RUST	[0] SCAB	[0] SCALD
[0] AY	[0] BSMV	[0] BYDV	[ ] OTHER (Specify)

12. INSECT: (0 = Not tested, 1 = Susceptible, 2 = Resistant)

[0] GREEN BUG	[0] ENGLISH GRAIN APHID	[0] CHINCH BUG	[0] ARMYWORM
[0] GRASS HOPPERS	[0] CEREAL LEAF BEETLE	[ ] OTHER (Specify)	

HESSIAN FLY RACES: [ ] GP [ ] A [ ] B [ ] C [ ] D [ ] E [ ] F [ ] G

13. CHEMICAL (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] DDT [ ] OTHER (Specify)

14. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	BARONESSE	Seed size	LEWIS
Leaf size	BARONESSE	Coleoptile elongation	BARONESSE
Leaf color	BARONESSE	Seedling pigmentation	LEWIS
Leaf carriage	BARONESSE		

REFERENCES: The following publications may be used as a reference aid for the standardization of character descriptions and terms used in this form:

1. Wiebe, G. A., and D. A. Reid, 1961, Classification of Barley Varieties Grown in the United States and Canada in 1958, Technical Bulletin No. 1224, U.S. Dept. of Agriculture.
2. Reid, D. A., and G. A. Wiebe, 1968, Barley: Origin, Botany, Culture, Winter Hardiness, Genetics, Utilization, Pests, Agriculture Handbook No. 338, U.S. Dept. of Agriculture. pp. 61 - 84.
3. Malting Barley Improvement Association, Milwaukee, Wisconsin, 1971, Barley Variety Dictionary.

COLOR: Nickerson's or any recognized color fan may be used to determine color of the described variety.

MONTANA STATE UNIVERSITY
BOZEMAN

Dr. Tom Blake, Professor
Department of Plant Sciences
College of Agriculture
Leon Johnson Hall
P.O. Box 173140
Bozeman, MT 59717-3140

2000001156

Plant Breeding
Plant Genetics
Plant Biology
Crop Science

Phone: (406) 994-5055 Fax: (406) 994-1848
E-mail: blake@hordeum.oscs.montana.edu

Dr. Loren Wiesner
National Seed Storage Laboratory
1111 S. Mason St.
Fort Collins, CO 80521-4500

Dr. Harold Bockleman
USDA/ARS National Small Grains Collection
P.O. Box 307
Aberdeen, ID 83210

Dear Harold and Loren,

Please find a completed application for storage, a copy of the paperwork I've sent to the PVP office and a copy of the registration manuscript I've sent off to Crop Science. A lot of work for a feed barley, but this one is pretty decent.

Best regards,

Tom Blake, professor
Montana State University

STORAGE APPLICATION

USDA-ARS
NATIONAL SEED STORAGE LABORATORY
FORT COLLINS, CO 80521 - 4500
(970) 495-3200

200000156

x Sent for Crop Registration

Cultivar_____ x

Germplasm_____

Genetic Stock_____

Parental Lines_____

UNTREATED SEED REQUIRED!!

Name of Donor Contact Person Tom Blake Telephone No.(406) 994 5055 Institution or Company Montana Agricultural Experiment Station Address 201 Linfield Hall Genus Hordeum Species vulgare Common Name barley

Amount Requested:7,500 seeds for Populations/Synthetics(Cultivar &Germplasm); 5,000 seeds for each pure line (Cultivar, Parental Inbred, Germplasm, and many Genetic Stocks*). **50-500 Seeds for special genetic stocks.

Name and/or Number Valier Other Identifiers MTLB30

PVP Applied For or Granted? Yes ___ No x Number_____

Plant Patent applied for or granted? Yes ___ No x Number_____

Reproductive System: Approximate percent self fertilization under normal field conditions: 98% Pureline_____ ; Population/Synthetic_____ ; or Parental Inbred_____

Percent Germination determined by Donor 99% Date of Test 10/1/99

If genetic stocks, will they require special handling? Yes ___ No___ If yes, identify contact person who will supply new seed source: _____
address: _____

Material already assigned a PI No.? Yes ___ No x If yes, give PI No. _____ Seed already provided to active collection? Yes x No___ If yes, give date 12/1/99 location NSGC, Aberdeen, ID amount of seed 1000 seeds

10

Year seed harvested 1999

200000156

The policy of the National Plant Germplasm System (NPGS) is that all material deposited in the NPGS will be freely distributed to scientists for research purposes. For material registered in Crop Science, the donor is expected to maintain and distribute seed for a minimum of 5 years following registration.

Signature Thomas K. Blake Date 11/30/99

Revised 9/97

DESCRIPTIVE INFORMATION - In order for each entry to be properly identified, donors are asked to prepare an abstract and pedigree of each entry. Key features in the abstract might include agronomically important traits such as maturity, plant height (metric terms or dwarf, semi-dwarf, etc.), seed characteristics (size, oil content, milling quality, type, etc.), nutritive value, tolerance to diseases, insects, nematodes, cold, lodging, and others. Give the scientific names of pest organisms. Avoid comparisons with other cultivars or lines unless these are part of the parentage or the comparisons are important for rating disease and insect resistance levels. All accessions deposited at the NSSL will be recorded in the Germplasm Resources Information Network (GRIN) database of the National Plant Germplasm System.

Abstract: (The abstract can be no more than 1000 characters in length.)

Valier is a to-rowed, white-kerneled midseason spring barley. Unlike its paternal parent 'Baronesse', Valier retains sterile lateral florets. Valier is nearly two days later to flower than its maternal parent, Lewis. Valier frequently develops red-tipped awns late in the season, an obvious and distinctive character. Valier is approximately two centimeters shorter than Lewis, with correspondingly greater lodging resistance.

Pedigree: (The pedigree should not exceed 500 characters.)

Valier is an inbred selection from the cross Lewis x Baronesse. Sixty F5 lines were derived by single seed descent, and Valier is a reselection from line LB30. Twenty-eight F9 headrow plots from the F5 were bulked together to form Valier.

GROWTH HABIT -

Annual (Spring x Winter _____ Facultative _____)

Biennial _____ Perennial _____ Woody _____ or Tree _____

FORM RECEIVED -

Seed x Plants _____ or Cuttings _____

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)

Montana Agricultural Experiment Station

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

MTLB30

3. VARIETY NAME

Valier

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*

202 Linfield Hall
Montana State University
Bozeman, MT 59717

5. TELEPHONE *(include area code)*

406 994 3681

6. FAX *(include area code)*

406 994 6579

7. PVPO NUMBER 200000156

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* If no, please explain. [X] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? [X] YES [ ] NO
If no, give name of country

10. Is the applicant the original owner? [X] YES [ ] NO *If no, please answer one of the following:*

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

[ ] YES [ ] NO If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

[ ] YES [ ] NO If no, give name of country

11. Additional explanation on ownership *(if needed, use reverse for extra space)*:

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

STD-470-E (07-97) *(Destroy previous editions).*
Electronic version designed using WordPerfect InForms by USDA-AMS-IMB.